

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A method for forming damascene features in a dielectric layer over a barrier layer over a substrate, comprising:

etching a plurality of vias in the dielectric layer to the barrier layer with a plasma etching process in the a plasma processing chamber;

forming a patterned photoresist layer with a trench pattern;

within a single plasma process chamber providing a combination via plug deposition to form plugs in the vias over the barrier layer and trench etch.

2. (Original) The method, as recited in claim 1, wherein the via plugs are formed by a plasma deposition.

3. (Original) The method, as recited in claim 2, wherein the via plugs are made of a fluorocarbon polymer.

4. (Original) The method, as recited in claim 3, further comprising a photoresist and via plug strip within the plasma process chamber subsequent to the providing the combination via plug deposition and trench etch.

5. (Original) The method, as recited in claim 4, further comprising opening a barrier layer within the plasma process chamber subsequent to the photoresist and via plug strip.

6. (Original) The method, as recited in claim 5, further comprising a depositing a feature barrier layer subsequent to opening the barrier layer, wherein the feature barrier layer is deposited over the substrate when the substrate is within the plasma process chamber.

7. (Currently Amended) ~~The A method, as recited in claim 5~~ for forming damascene features in a dielectric layer over a barrier layer over a substrate, comprising:

etching a plurality of vias in the dielectric layer to the barrier layer with a plasma etching process in a plasma processing chamber;

forming a patterned photoresist layer with a trench pattern;

within a single plasma process chamber providing a combination via plug deposition to form plugs in the vias over the barrier layer and trench etch, wherein the via plugs are formed by a plasma deposition, wherein the via plugs are made of a fluorocarbon polymer, wherein the providing the combination via plug deposition to form plugs in the vias and trench etch, comprises providing a plug forming gas and an active etchant in the plasma process chamber simultaneously and forming a plasma from the plug forming gas and the active etchant;

a photoresist and via plug strip within the plasma process chamber subsequent to the providing the combination via plug deposition and trench etch; and

opening a barrier layer within the plasma process chamber subsequent to the photoresist and via plug strip.

8. (Currently Amended) ~~The A method, as recited in claim 5~~ for forming damascene features in a dielectric layer over a barrier layer over a substrate, comprising:

etching a plurality of vias in the dielectric layer to the barrier layer with a plasma etching process in a plasma processing chamber;

forming a patterned photoresist layer with a trench pattern;

within a single plasma process chamber providing a combination via plug deposition to form plugs in the vias over the barrier layer and trench etch, wherein the via plugs are formed by a plasma deposition, wherein the via plugs are made of a fluorocarbon polymer, wherein the providing the combination via plug deposition to form plugs in the vias and trench etch, comprises providing a cyclic process with a via plug formation phase and a trench etch phase, wherein the cycle is performed more than three times;

a photoresist and via plug strip within the plasma process chamber subsequent to the providing the combination via plug deposition and trench etch; and  
opening a barrier layer within the plasma process chamber subsequent to the photoresist and via plug strip.

9. (Original) The method, as recited in claim 8, wherein in the via plug formation phase comprises:

providing a via plug formation gas comprising  $C_4F_8$ ,  $CH_2F_2$ , Ar, and  $O_2$  to the plasma process chamber; and

forming a plasma from the via plug formation gas; and

wherein the trench etch phase, comprises:

providing a trench etch gas comprising  $CF_4$ ,  $CHF_3$ , and  $O_2$  to the plasma process chamber; and

forming a plasma from the via plug formation gas.

10. (Original) The method, as recited in claim 5, wherein the plasma deposition forming the via plugs deposits more on the bottoms of the vias than on sidewalls of the vias.

11. (Original) The method, as recited in claim 5, wherein the photoresist and via plug strip is provided by an ashing process.

12. (Original) The method, as recited in claim 11, wherein the ashing process is selected from the group of an  $O_2$  based ashing and an  $N_2 / H_2$  based ashing.

13. (Original) The method, as recited in claim 5, wherein the providing a combination via plug deposition and trench etch, comprises providing a gas selected from the group comprising a fluorocarbon and a hydrofluorocarbon.

14. (Original) The method, as recited in claim 12, wherein the gas further comprises an inert carrier gas and an additive gas selected from the group comprising oxygen and hydrogen.

15. (Original) The method, as recited in claim 2, wherein each of the plurality of vias have sidewalls and bottoms, wherein the via plug deposition deposits a thicker layer on the bottoms of the vias than on the sidewalls.

16. (Original) A semiconductor device formed by the method as recited in claim 1.

17-19 (Canceled)

20. (New) A method for forming damascene features in a dielectric layer over a barrier layer over a substrate, comprising:

etching a plurality of vias in the dielectric layer to the barrier layer with a plasma etching process in a plasma processing chamber;

forming a patterned photoresist layer with a trench pattern;

within a single plasma process chamber providing a combination via plug deposition to form plugs in the vias over the barrier layer and trench etch, wherein the providing the combination via plug deposition to form plugs in the vias and trench etch, comprises providing a plug forming gas and an active etchant in the plasma process chamber simultaneously and forming a plasma from the plug forming gas and the active etchant.

21. (New) A method for forming damascene features in a dielectric layer over a barrier layer over a substrate, comprising:

etching a plurality of vias in the dielectric layer to the barrier layer with a plasma etching process in a plasma processing chamber;

forming a patterned photoresist layer with a trench pattern; and

within a single plasma process chamber providing a combination via plug deposition to form plugs in the vias over the barrier layer and trench etch, wherein the providing the combination via plug deposition to form plugs in the vias and trench etch, comprises providing a

cyclic process with a via plug formation phase and a trench etch phase, wherein the cycle is performed more than three times.